Geography

The Spokane Valley-Rathdrum Prairie Aquifer flows beneath a broad valley that slopes downward from Lake Pend Oreille to downtown Spokane, losing almost 700 feet in elevation. The basalt formation that creates Spokane Falls diverts the Aquifer flow north after downtown Spokane. Five Mile Prairie splits the Aquifer flow from downtown Spokane with the Hillyard Trough to the east and the Spokane River valley to the west. North of downtown Spokane the surface elevation rises and then drops steeply at the confluence of the Spokane and Little Spokane Rivers. In general, the higher the surface elevation, the greater the depth to the Aquifer.

The valley above the Aquifer covers approximately 202 square miles in Idaho, including the Rathdrum Prairie, and 120 square miles in Washington, including the Spokane Valley. The valley walls are composed of rocks and clay that continue below the ground surface to form the edges of the Aquifer. Relatively flat basalt plateaus such as Five Mile Prairie and the Columbia Plateau rise hundreds of feet above the valley.

The Bitterroot Mountains east of Rathdrum Prairie and the Selkirk Mountains along the Washington - Idaho border form other Aquifer edges. These mountains are more than 2,000 feet higher than the basalt plateau to the southwest, so clouds carried by the prevailing southwesterly winds must rise when they reach the mountains. As the clouds climb they release more precipitation, often as snow, which provides significant recharge to the Aquifer during the spring.

Several lakes are situated in the mountains around the borders of the Aquifer. The two largest lakes, Pend Oreille and Coeur d'Alene, fill deep troughs and contribute water to the Aquifer through subsurface flow. The surface outlet for Lake Pend Oreille is the Pend Oreille River that drains to the north, away from the Aquifer. The surface outlet for Lake Coeur d'Alene is the Spokane River, which is the only watercourse over the Aquifer that remains on the surface for an extended distance.

Few streams flowing out of the surrounding highlands actually reach the river. These streams contact the coarse, gravelly soils overlying the Aquifer and disappear, percolating downward.